REMARKS

The application contains claims 8-14.

With regard to the examiner's Office action mailed May 21, 2002, the examiner is respectfully reminded that the present application is a national stage application filed under 35 USC 371 of international application No. PCT/DE00/00685, not a national application filed under 35 USC 111(a). As a result, unity of invention, not restriction practice, applies. See MPEP 801 and 1893.03(d). Claim 8 is directed to a method for producing an armature shaft. Claim 12 is directed to an armature shaft produced by the method of claim 8. Unity of invention exists between claim 8 and claim 12 because the method of claim 8 inherently produces the product of claim 12. Unity of invention is not negated by the fact that the product could be produced by a different process. For at least the above reason, the examiner's restriction requirement is improper and applicant is entitled to maintain both the process claims and the claims directed to the product made by the process in the present application. Reconsideration of the rejection of claims 8-14 under 35 USC 112, second paragraph, as indefinite is respectively requested. In the Office action mailed May 21, 2002, the examiner determined that claims 8-11 were directed to a method of making an armature. No amendment to claims 8-11 were presented in applicant's response filed on June 19, 2002. Claims 8-11 have now been amended to be consistent with the examiner's determination. The claims now fully comply with the requirements of 35 USC 112.

Reconsideration of the rejection of claims 8 and 9 under 35 USC 102(b) as anticipated by Kobayashi et al is respectfully requested. As explained in applicant's specification, it is known in the prior art to produce a worm by reshaping an armature

shaft of an electric motor in one piece with the armature shaft. After the worm is produced, the armature shaft is assembled from its individual parts, including, for example, an armature lamination packet, a commutator and a bearing. To enable placing the individual parts of the armature onto the armature shaft, an outer diameter of the worm produced by reshaping must not be any greater than the diameter of the armature shaft over the remaining length of the armature shaft. This has the disadvantage that an armature shaft of large diameter is necessary, or the worm must have a small diameter, and this limits a load-bearing force and thread pitch of the worm. In the method according to applicant's invention, the armature is first assembled from its individual parts; that is, the armature lamination packet, commutator and sliding and/or roller bearings are placed on the armature shaft, and next the worm is produced by reshaping of the armature shaft. In this way, it is possible to produce the worm with a larger diameter than the remaining armature shaft, since the individual parts of the armature do not have to be placed on the armature shaft past the worm.

Kobayashi et al describes an armature shaft onto which, by means of rolling, two worms are formed, one with counterclockwise threads and the other with clockwise threads. The outer diameter of these worms is the same as or less than the diameter of the remainder of the armature shaft 16. It is, therefore, possible for all the components parts of the armature shaft, for example, the bearing 31, commutator 15, and armature packet 14, to be thrust onto the armature shaft 16 over the worm after the rolling operation. In Kobayashi et al, there is no teaching or suggestion that the worm is formed after the assembly of the armature component parts as required by claim 8. On the contrary, the larger diameter of the armature shaft is an indication of the order

Not Claimed

of assembly, which is conventional in the prior art, that is, first, the worm is produced by shaping and, then, the individual parts of the armature are mounted to the shaft. One of ordinary skill in the art would not have been taught by Kobayashi et al to first mount the individual component parts of the armature onto the armature shaft and then, only after completion of the assembly, forming the worm by reshaping.

Reconsideration of the rejection of claims 8, 9 and 12-14 under 35 USC 102(b) as anticipated by Thrasher, Jr. et al is respectfully requested. Thrasher also shows an electric motor with an armature shaft 18, onto which a worm is formed by means of rolling. The outer diameter of the worm 20 is greater than the diameter of the armature shaft. The shaft is supported in the housing by means of bearings 24 and 26. Disposed between the armature packet 16 and the worm 20 is a damper 28, which is intended to damp vibration of the armature during operation. The inside diameter of the damper is greater than the outside diameter of the worm 20. Thrasher teaches, beginning at col. 2, line 67, that "[t]he inner diameter 36 of the collar 30 is large enough so that the damper 28 can slide over the worm 20, which may be formed by rolling and therefore have a diameter greater than that of the armature shaft 18." Also, Thrasher teaches, beginning at col. 3, line 14, that "[t]he fingers 32 are of a spring-like nature that allows the armature shaft 18, including worm 20, to be installed into the gear housing 14 through the damper 28." That is, the damper 28 is thrust over the armature shaft expressly after the forming of the worm on the shaft. Thus, Thrasher specifically teaches away from the limitation found in applicant's claim 8 requiring that the worm be formed on the shaft after the bearings and other armature components have been put in place on the shaft.

Further, with regard to claims 13 and 14, the damper 28 in Thrasher is not fixed or mounted on the armature shaft, but rather is press fit into the gear housing 14. See col. 2, lines 64, 65. Thus, Thrasher does not teach a bearing seat, whose outer diameter is at least as great as an outer diameter of the worm and is mounted on the armature shaft between the worm and the other parts of the armature as required by claims 13 and 14. Thus, Thrasher does not anticipate claims 13 and 14.

Reconsideration of the rejection of claims 10 and 11 under 35 USC 103(a) as unpatentable over Kobayashi et al in view of Elson et al is respectfully requested. Elson discloses a portable circular saw having a saw blade supported on an armature shaft. To this end, a pinion 29 with a shoulder 33 is form onto the armature shaft 26. With regard to how the other component parts are mounted on the shaft after the pinion and shoulder are form, Elson teaches, beginning at col. 4, line 29, that "[t]he armature shaft 26 has the pinion 29 formed thereon . . . and thereafter, the diameter of the shaft is reduced so as to form the annular shoulder 33. The sleeve 34 is press-fitted on the shaft 26 from the rear end of the shaft, see FIGURE 4, and abuts against the shoulder 33. Next, the spacer collar 35 is slidably fitted on the armature shaft 26; and thereafter, the stack of laminations 27 is secured on the armature shaft . . . in the usual fashion." Therefore, claim 8, calling for the worm to be produced, at the end of the armature assembly, by reshaping the armature shaft is novel and unobvious over Elson and over the combined teachings of Kobayashi and Elson. In addition, claims 10 and 11 require that before the production of the worm a tubular bearing seat or a shaft bearing is mounted on the armature shaft. In Elson, the sleeve 14 is mounted on the shaft after the pinion is formed, the opposite of what is claimed.

In accordance with the foregoing, applicant respectfully requests that the examiner reconsider and withdraw the outstanding rejections. If, however, the examiner feels that any further issues remain or require clarification, the examiner is cordially invited to contact the undersigned in order that any such issues may be promptly resolved.

Respectfully submitted,

Date: October 10, 2002

Ronald E. Greigg
Attorney for Applicant
Registration No. 31,517
Customer No. 02119

GREIGG & GREIGG, P.L.L.C.
1423 Powhatan Street, Suite One
Alexandria, VA 22314

Tel. (703) 838-5500
Fax. (703) 838-5554

REG/JFG/hhl